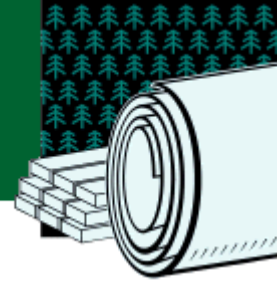


FOREST PRODUCTS

Project Fact Sheet



WIRELESS MICROWAVE WOOD MOISTURE MEASUREMENT SYSTEM FOR WOOD DRYING KILNS

BENEFITS

- Minimized energy consumption
- Reduced drying costs
- Improved lumber quality

APPLICATIONS

The sensor system will provide accurate moisture content of wood during the kiln drying process. The total U.S. market is expected to total around 180,000 sensors.

New Real-Time Sensing System for Drying Kilns Will Reduce Drying Costs and Energy Consumption

More accurate sensor systems to measure moisture content during kiln drying can significantly improve kiln performance. Project partners are developing a sensor system that can survive the harsh environment of the kiln and provide accurate measurements of wood with wide-ranging moisture contents. The technology is expected to reduce energy requirements and improve quality and yield of kiln dried lumber.

This low-cost technology uses multiple sensors in conjunction with a wireless telemetry system to transfer data directly to a process control computer, providing real-time moisture content measurements for many points in a stack of lumber. Because the user can rely on actual measurements rather than rule-of-thumb estimates, lumber can be dried more efficiently. Possible savings to the industry are anticipated to be \$500 million annually.



OFFICE OF INDUSTRIAL TECHNOLOGIES
ENERGY EFFICIENCY AND RENEWABLE ENERGY • U.S. DEPARTMENT OF ENERGY

PROJECT DESCRIPTION

Goal: Demonstrate feasibility of a suite of compact, inexpensive sensors to provide moisture content of lumber during kiln drying.

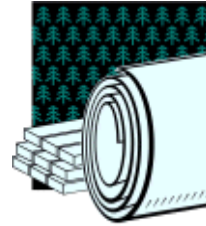
In this new suite of sensors, multiple systems with wireless telemetry transmit moisture content data of lumber during kiln drying. The sensor suite will be contained in a small package, permitting it to be positioned on the surface of stacked lumber. The package will transmit moisture content data via spread-spectrum radiofrequency signals to receiving antenna in the kiln. This data will be sent to a computer for analysis, kiln control, and display to the kiln operator.

Initial research will focus on evaluating two types of sensors, and the chosen sensor will then be optimized. During the second year, researchers will fabricate a microwave sensor for operation in a research kiln. A wireless data telemetry system for operation in a kiln will also be designed. In the third year, a suite of moisture content sensors will be built and tested in a research kiln with the goal of obtaining content data on lumber from several locations in the kiln at regular intervals throughout the drying cycle.

PROGRESS & MILESTONES

During this project, researchers will complete the following milestones:

- Demonstration and validation of a "bench top" moisture sensor for operation in a research kiln at temperatures up to 180 F;
- Demonstration of sensor operation in research kiln and a study on the spread-spectrum wireless telemetry system; and
- Demonstration of operation of suite of sensors in research kiln with wireless data transmission.



PROJECT PARTNERS

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